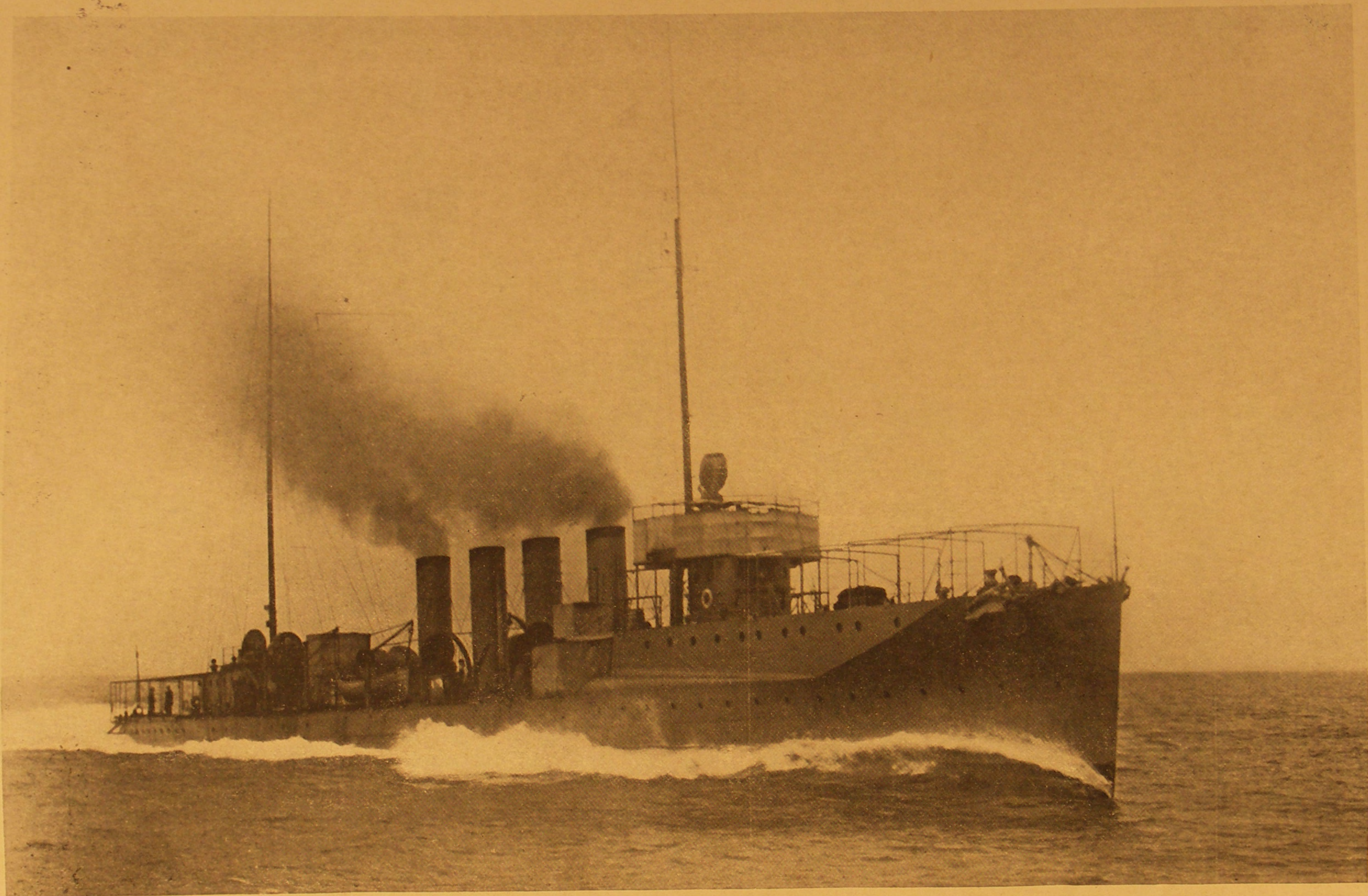


RESTRICTED

GENERAL INFORMATION
INCLUDING
DESCRIPTIONS AND TESTS
OF
ELECTRIC AUXILIARIES

U. S. S. O'BRIEN, TORPEDO BOAT DESTROYER No. 51
U. S. S. NICHOLSON, TORPEDO BOAT DESTROYER No. 52
U. S. S. WINSLOW, TORPEDO BOAT DESTROYER No. 53

INFORMATION RELATIVE TO ITEMS UNDER COGNIZANCE
OF THE BUREAU OF CONSTRUCTION AND REPAIR,
NAVY DEPARTMENT



1915

BUREAU OF
NAT. AFF.

BUREAU OF SHIP
NATIONAL ARCHIVES

RESTRICTED
~~CONFIDENTIAL~~

Serial No. **20**

GENERAL INFORMATION
INCLUDING DESCRIPTIONS AND TESTS OF
ELECTRIC AUXILIARIES

JOINT BOOKLET FOR

U. S. S. O'BRIEN, Torpedo Boat Destroyer No. 51
U. S. S. NICHOLSON, Torpedo Boat Destroyer No. 52
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INFORMATION RELATIVE TO ITEMS
UNDER COGNIZANCE OF
BUREAU OF CONSTRUCTION AND REPAIR
NAVY DEPARTMENT

BUILDERS:
Wm. Cramp and Sons' Ship and Engine Building Company
PHILADELPHIA, PENNSYLVANIA

OFFICE OF THE SUPERINTENDING CONSTRUCTOR
FOR U. S. NAVY
WM. CRAMP AND SONS' SHIP AND ENGINE BUILDING COMPANY
PHILADELPHIA, PENNSYLVANIA

FINISHED PLAN NO. 38 TAKEN FROM WORK

1915

50637

BUREAU OF SHIPS
NATIONAL ARCHIVES FILES

CHRONOLOGY OF BUILDING

EVENT	DATA		
	O'BRIEN	NICHOLSON	WINSLOW
Authorized by Act of Congress.....	Aug. 22, 1912	Aug. 22, 1912	Aug. 22, 1912
Advertisement issued by Navy Department.....	Aug. 26, 1912	Aug. 26, 1912	Aug. 26, 1912
Bids received.....	Oct. 18, 1912	Oct. 18, 1912	Oct. 18, 1912
Plans and specifications delivered to contractors.....	Dec. 11, 1912	Dec. 11, 1912	Dec. 11, 1912
Contract signed.....	Dec. 7, 1912	Dec. 7, 1912	Dec. 7, 1912
First hull material ordered.....	Dec. 17, 1912	Dec. 17, 1912	Dec. 17, 1912
Lines faired in mold loft.....	Dec. 20, 1912	Dec. 20, 1912	Dec. 20, 1912
First hull material received.....	Feb. 21, 1913	Feb. 21, 1913	Feb. 21, 1913
Keel laid.....	Sept. 8, 1913	Sept. 8, 1913	Oct. 1, 1913
First frame raised.....	Oct. 13, 1913	Oct. 13, 1913	Oct. 17, 1913
First compartment tested.....	Mar. 27, 1914	May 26, 1914	May 27, 1914
Vessel launched.....	July 20, 1914	Aug. 19, 1914	Feb. 11, 1915
Vessel docked.....	May 3-4, 1915	Mar. 9-12, 1915	June 9-10, 1915
Dock trial.....	Dec. 1, 1914	Mar. 13, 1915	June 7, 1915
First sea trial by contractors.....	Dec. 16, 1914	Mar. 14-15, 1915	June 16, 1915
Contract date of completion.....	Nov. 7, 1914	Nov. 21, 1914	Dec. 7, 1914
Standardization trial.....	May 7, 1915	Mar. 23, 1915	June 29, 1915
Delivered to Navy Department at Philadelphia Navy Yard.....	May 22, 1915	April 30, 1915	Aug. 7, 1915
Contract price.....	\$842,000.00	\$842,000.00	\$842,000.00

This book was prepared by authority of the Bureau of Construction and Repair and as per contents on succeeding pages contains lists and descriptions of the various features and systems that have been installed under cognizance of the Bureau.

**STATEMENT OF LOADS, CONTEMPLATED IN DETERMINING THE MEAN
DRAFT CORRESPONDING TO THE "DESIGNERS' WATERLINE" IN
ACCORDANCE WITH CIRCULAR LETTER 11-1, 96, 44; (15635-A-115)
DATED JUNE 30, 1915**

In the design of the vessel the mean draft corresponding to the "Design Waterline," viz.—9 feet 5½ inches, contemplated the following conditions of loading:—Ship complete ready for service in every respect, with full complement officers and crew with their effects and consumable load as tabulated below.

ITEM	Proportion of Designed Allowance	Weight Tons
Ammunition including torpedoes.....	Full	18.25
320 rounds 4-inch cartridges.....	...	.....
6,000 rounds 30 cal. rifle (ball).....	...	.....
4,800 rounds 30 cal. rifle (ball).....	...	.....
1,000 rounds 30 cal. rifle (dummy).....	...	.....
8 warheads.....	...	.....
8 torpedoes.....	...	.....
C. & R. stores.....	2/3	1.33
Navigators' stores.....	2/3	.06
Steam engineering (Govt.) stores.....	2/3	1.67
Ordnance stores.....	2/3	.67
Equipment stores.....	2/3	2.72
Supplies and accounts stores.....	2/3	6.32
Medical stores.....	2/3	.20
Officers' mess stores.....	2/3	1.11
Potable water.....	2/3	9.73
Reserve feed water.....	2/3	12.33
Fuel (ships').....	2/3	206.00
Hull complete.....	...	323.40
Hull fittings.....	...	43.14
Steam engineering (including water in machinery).....	...	347.67
Battery.....	...	30.49
Equipment.....	...	23.09
Outfit.....	...	18.03
Margin.....	...	3.85
Total.....		1,050.06

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COMPLEMENT—MESSES—BERTHS

OFFICERS

Commanding Officer.....	1
Wardroom Officers.....	5

CHIEF PETTY OFFICERS

Chief boatswain's mate.....	1
Chief gunner's mate.....	1
Chief quartermaster (Navigating).....	1
Chief machinist's mates.....	3
Chief water tender.....	1
Hospital steward.....	1

SEAMAN BRANCH

Boatswain's mate (second class).....	1
Coxswains.....	1
Gunner's mates, first class.....	2
Gunner's mates, second class.....	2
Gunner's mates, third class.....	2
Quartermaster, first class.....	1
Quartermaster, second class.....	2
Seamen.....	16
Ordinary seamen.....	13

ARTIFICER BRANCH

Electrician, first class.....	1
Electrician, first class, wireless.....	1
Carpenter's mate, second class.....	1

ARTIFICER BRANCH

(Engine room force)

Machinist's mates, first class.....	3
Machinist's mates, second class.....	3
Water tenders.....	5
Boiler makers.....	1
Blacksmith.....	1
Coppersmith.....	1
Oilers.....	4
Firemen, first class.....	10
Firemen, second class.....	7

SPECIAL BRANCH

Yeoman, first class, Commanding Officer...	1
Yeoman, second class, engineer department.	1

COMMISSARY BRANCH

Ship's cook, first class.....	1
Ship's cook, third class.....	1

MESSMEN BRANCH

Cabin steward.....	1
Cabin cook.....	1
Mess attendant.....	2

RECAPITULATION

Commanding Officer.....	1
Executive Officer.....	1
Senior engineer officer.....	1
Torpedo officer.....	1
Duty officer (Ensign).....	1
Ensign.....	1
Chief petty officers.....	8
Seaman branch.....	40
Artificer branch.....	3
Artificer branch (engine room force).....	35
Special branch.....	2
Commissary branch.....	2
Messmen branch.....	4
Total.....	100

NUMBER OF MESSES

Crew's.....	5
Chief petty officers'.....	1

STATEROOMS AND BERTHS

Commanding Officer's stateroom and berth.	1
Wardroom officers' staterooms and berths...	5
Yeomans' office and berth.....	1
Chief petty officers' berths (in comp't. D-10½).....	8
Crew's berths, forward.....	54
Crew's berths, aft.....	30

GENERAL DIMENSIONS

Length over all.....	305'-3"
Length between perpendiculars.....	300'-0"
Projection forward of F. P.....	2'-0"
Projection aft of A. P.....	3'-3"
Length of straight keel.....	256'-3 1/2"
F. P. to straight keel.....	14'-0"
A. P. to straight keel.....	29'-8 3/4"
Length of fender.....	171'-6"
F. P. to fender.....	59'-6"
A. P. to fender.....	69'-0"
Length of bilge keel.....	140'-0"
F. P. to bilge keel.....	85'-9"
A. P. to bilge keel.....	74'-3"
Length on 9'-5 1/2" waterline (D. W. L.).....	300'-0"
Breadth extreme, over fenders.....	31'-1"
Breadth extreme, outside of plating.....	30'-7"
Breadth molded.....	30'-6"
Breadth molded, at 8-foot waterline.....	29'-6 3/4"
Mean draft to bottom of keel at mean trial displacement, about.....	9'-5 1/2"
Midship section, frame No. 85-5/7.....	.....
Frame spacing (regular).....	1'-9"
Contract displacement 9'-5 1/2" actual draft tons salt water.....	1050
Tons per inch at 9'-5 1/2" waterline.....	14.39
Area of wetted surface, square feet.....	9760
Coefficient of fineness, block.....	.426
Coefficient of fineness, midship section.....	.684
Coefficient of fineness, 9'-5 1/2" waterline.....	.66
Total area of rudder, square feet.....	60.23
Area of midship section, square feet (Frame No. 85-5/7) 6" fwd. Fr. 86.....	196.6

HEIGHTS ABOVE DESIGNED LOAD WATERLINE.

Designed load waterline above bottom of keel amidships.....	9'-5 1/2"	
Top of ball on foremast.....	95'-3"	
Top of truck light on mainmast.....	95'-7"	
Top of pilothouse at centerline (Frame No. 40) (top of plating).....	23'-10 3/4"	
Forecastle deck plating at stem (top of plating).....	16'-10 7/8"	
Main deck plating at stern (top of plating).....	7'-10 1/2"	
Bridge at side Frame No. 40 top of beam.....	23'-4 1/2"	
Bridge at centerline above forecastle deck (molded).....	7'-4"	
Platform deck beams at Frame No. 53.....	1'-5 7/8"	
Platform deck beams at Frame No. 126.....	7 1/2"	
Floor of searchlight platform (top of plating).....	30'-4 1/4"	
Centerline of forward searchlight (Frame No. 43 1/2).....	34'-7-3/16"	about
Centerline of aft searchlight (Frame No. 135 1/2).....	19'-9-3/16"	about
Centerline of 5.2M by 45CM Twin Torpedo Tube (Frame 75 port).....	11'-4 3/8"	about
Centerline of 5.2M by 45CM Twin Torpedo Tube (Frame 75 st'b'd).....	11'-4 3/8"	about
Centerline of 5.2M by 45CM Twin Torpedo Tube (Frame 116 1/2 port).....	10'-11"	
Centerline of 5.2M by 45CM Twin Torpedo Tube (Frame 110 1/2 st'b'd).....	10'-11"	
Centerline of 4" R. F. G. (Frame No. 25 C. L.).....	20'-7"	
Centerline of 4" R. F. G. (Frame No. 54 port).....	12'-9 3/8"	
Centerline of 4" R. F. G. (Frame No. 54 st'b'd).....	12'-9 3/8"	
Centerline of 4" R. F. G. (Frame No. 146 C. L.).....	12'-1 7/8"	

STEERING ARRANGEMENTS

The ship is provided with four steering stations: A steam gear in the pilot house, a steam gear on top of the pilot house, a trick wheel at the steering engine, and a hand gear on top of the after house.

The steam steering engine, built by the American Engineering Company, Philadelphia, Pa., is a 6-inch by 6-inch vertical type for $1\frac{3}{8}$ -inch chain. It is located in the after end of the after house on the main deck, and may be operated by either of the steering wheels forward or by the trick wheel at the engine. Instructions for steering from the different stations are given below.

All the steering gear with the exception of the leads forward is installed in the main deck.

The transmission from the steering engine to the quadrant on the rudder head is by means of a $1\frac{3}{8}$ -inch galvanized wrought iron U. S. N. Standard chain. It is fitted at the ship's sides in chafing channels along the main deck and held in place by means of roller fair leads suitably located, and by two 16-inch diameter chain wheels which take the spread, the taking up of the slack was provided for by the insertion of turnbuckles.

The control transmission from the forward steering stations to the steering engine consists of $\frac{3}{8}$ -inch diameter plough steel wire rope running under the main deck on the starboard side and which is encased in a 1-inch standard brass pipe. The outboard spread is secured by means of leader sheaves, located between frames Nos. 60-61 and 122-124.

The hand steering standard on the after house is arranged to operate the wild cat on the steering engine by means of gearing. Two lever operated clutches with positive control are fitted to disconnect the power shaft or hand gear as required. A clutch coupling is also provided for releasing or connecting the steering standard on the pilot house top, and another at the steering engine for making or breaking the control transmission forward. An emergency relieving tackle is provided, consisting of $2\frac{1}{2}$ -inch circumference steel wire rope pendants attached to eyes on top of the quadrant arms for use with 10-inch single and 10-inch double iron blocks with $3\frac{1}{2}$ -inch circumference manila falls. Pad eyes for the 10-inch single blocks referred to are fitted at frame No. 156, port and starboard.

At each steering wheel forward and at the hand steering wheel aft there is a dial and pointer indicating the helm angle. An indicator is also provided at the rudder head.

INSTRUCTIONS FOR STEERING FROM THE VARIOUS STATIONS.

To Steer from Pilot House.

Throw out clutch in pilot house on vertical shaft leading to steering standard on bridge and the lever controlled clutch on the hand steering system. Throw in the clutches coupling the steering engine to the wildcat and to the forward control gear.

To Steer from Pilot House Top.

Proceed as directed above excepting that the clutch in pilot house on the vertical shaft must be thrown in.

To Steer by Trick Wheel at Steering Engine.

Throw out the clutches coupling the hand and forward steam steering controls and throw in the clutch connecting the wildcat to the steam steering engine.

To Steer by Hand Gear on After House Top.

Throw out the clutch coupling the steering engine to the wildcat and throw in the clutch coupling the wildcat to the hand steering gear.

ST
STEER

Speed of vessel, knots.....
From amidship rudder to left
observed at bridge to left
Time observed at rudder head
Estimated diameter of turning
Initial heel, inward, degrees.
Final heel, inward, degrees.
From left rudder to amidship
observed on bridge, seconds
Time observed at rudder head
From left rudder to 35 degrees
served on bridge, seconds
Time observed at rudder head
Estimated diameter of turning

Radius of rudder
Total area
Area of balance
Angle of rudder
Revolution
over top

Built by American
Type 6-inch
engine
Number of
Diameter of
Stroke of piston
Working stroke
All parts suit
of, piston
Angle of steering
Revolution

TWO

Drive out all keys
casting, vertical tube, lower
ring in stock for attaching
turning the nut. Raise
rudder.

Cut out the rivets
rudder down until top

STEERING GEAR TESTS—PRELIMINARY TRIAL

	O'BRIEN	NICHOLSON	WINSLOW
Speed of vessel, knots.....	29.0	29.0	29.0
From amidship rudder to left rudder 35 degrees, time observed at bridge to shift rudder, seconds.....	8.0	8.3	9.0
Time observed at rudder head for above, seconds.....	8.0	8.0	12.0
Estimated diameter of turning circle, yards.....	700.0	650.0	650.0
Initial heel, inward, degrees.....	3.0	2.0	3.0
Final heel, inward, degrees.....	2.0	1.5	1.75
From left rudder to amidship rudder 35 degrees, time observed on bridge, seconds.....	7.0	.....	.....
Time observed at rudder head for above, seconds.....	7.0	6.0	.....
From left rudder to 35 degrees right rudder, time observed on bridge, seconds.....	10.0	12.9	13.5
Time observed at rudder head for above, seconds.....	10.0	13.0	14.0
Estimated diameter of turning circle, yards.....	750.0	700.0	.....

Steering Gear Data.

Radius of rudder quadrant to center line of chain, feet...	7.125
Total area of rudder, square feet.....	60.23
Area of balanced portion, square feet.....	10.59
Angle of rudder stops, degrees.....	38.00
Revolution of handwheels aft steering machine, from hard over to hard over.....	30.00

Steering Engine Data.

Built by American Engineering Company, Philadelphia, Pa.	.....
Type 6-inch by 6-inch, vertical, 1 $\frac{3}{8}$ -inch chain, steam engine.....	.....
Number of cylinders.....	2
Diameter of cylinders, inches.....	6
Stroke of piston, inches.....	6
Working steam pressure, pounds.....	200
All parts sufficiently strong to withstand full boiler pressure of, pounds.....	260
Angle of steering engine stops, degrees.....	38
Revolutions of trick wheel from hard over to hard over...	9.84

TWO METHODS OF UNSHIPPING RUDDER

First Method.

Drive out all keys in way of quadrant in deck casting on main deck. Remove quadrant deck casting, vertical tube, lower steady bearing, and tapered pin through nut. Replace quadrant key and ring in stock for attaching purchase. Let the nut bear against the collar and back out the stock by turning the nut. Raise rudder stock so that the lower end will be above the contour of the stern. Remove rudder.

Second Method.

Cut out the rivets connecting gudgeon to stern post. Remove collar, unscrew nut. Drop the rudder down until top of same is below the bottom of the stock. Remove rudder.

ANCHOR WINDLASS

The anchor windlass is located on the forecastle deck at frame No. 11, centerline. It is operated by a vertical type steam engine mounted on the forward side of bulkhead No. 12, main deck. The engine drives the windlass and wildcat through a vertical shaft, the transmission being through worm gearing. For heaving in by hand it is necessary to remove the block key engaging gypsy with locking head.

The gypsy head and wildcat are so arranged that either may be worked independently of the other. The windlass engine and windlass were furnished by the American Engineering Company, Philadelphia, Pa. The engine is designed for a working steam pressure of 200 pounds per square inch, the specifications requiring that it be capable of withstanding the full boiler pressure of 260 pounds per square inch. The engine is a direct acting reverse valve type 5 inches by 5 inches with two cylinders.

Provision is made for dismounting the gearing at the engine, without disturbing that part of the windlass located on the forecastle deck.

The wildcat is designed to take a standard 1-inch close link anchor chain. This chain is furnished by the Government. For controlling the wildcat, a friction band brake is fitted which provides control for either direction of rotation, the controlling gear consisting of two turnbuckle screws operated by hand lever wheels.

Riding bitts which act as chain clearers are fitted forward of the windlass, and so designed that chain will be cleared from the wildcat when running in either direction.

The engine has a 1½-inch steam and a 2-inch exhaust pipe, and is controlled from the forecastle deck by means of a hand wheel. This hand wheel operates the throttle valve through a connecting rod and lever.

AMMUNITION HANDLING AND LOADING ARRANGEMENTS

Stowage.

Provision is made for stowing 4-inch ammunition for the main battery as follows: 264 tanks in the forward magazine, Compartment A-10-M, and 150 tanks in the after magazine, Compartment D-6-M, hold. Small arms ammunition is stowed in a separate magazine, Compartment A-10-M. Torpedo warheads are stowed in Compartment A-12-M. Provision is made for stowing eight 45 c.m. torpedoes, one in each tube.

Handling.

For handling torpedoes, four portable cranes are provided which are interchangeable in any of six sockets located on the main deck near the torpedo tubes—two in way of each of the forward positions and one in way of each of the after positions. Handling torpedo warheads is accomplished by means of overhead tracks fitted in the forward and after magazines, Compartments A-12-M and D-3-M, on which run trolley hoists (one in each compartment) of 500 lbs. capacity fitted with brakes and 7-foot hand whip hoists by means of which the warhead cases are transported to the striking down hatches in the handling rooms.

A portable davit stepping into a socket located on the forecastle deck at frame No. 46 near the centerline, and provided with a 2-inch Manila hand whip hoist fitted with 6-inch single blocks is provided for raising the warheads and ammunition forward through the striking down hatch, and for whipping ammunition up to the forecastle deck.

The warheads and ammunition aft are raised through the after striking down hatch by means of a whip similar to that described above but which is suspended from the top of the after deckhouse over the hatch at frame No. 136.

Three deck trucks were provided for transporting warheads and torpedoes from points of delivery on the main deck to the torpedo tubes.

Ammunition is served to the battery from points of delivery on the decks by paths indicated on Plan No. H-49108, Official No. 160, Wm. Cramp & Sons H-49108, Plan No. 26 in Portfolio No. 1.

AMMUNITION HANDLING AND LOADING ARRANGEMENTS

LIST OF AMMUNITION

Type	Compartment	Total Capacity
4-in. ammunition	A-11-M	264 tanks
4-in. ammunition	D-6-M	150 tanks
4-in. ammunition	A-10-M	5 tanks
4-in. ammunition	D-3-M	5 tanks
4-in. ammunition	A-10-M	8 boxes
4-in. ammunition	A-10-M	9,600 cartridges
4-in. ammunition	A-10-M	7 boxes
4-in. ammunition	A-10-M	8,400 cartridges
4-in. ammunition	A-10-M	1 box
4-in. ammunition	A-10-M	1,000 cartridges
4-in. ammunition	A-10-M	8 boxes
4-in. ammunition	A-12-M	16,000 cartridges
4-in. ammunition	D-3-M	6 warheads
4-in. ammunition	A-10-M	2 warheads
4-in. ammunition	A-10-M	1 tank
4-in. ammunition	Stowed in tubes	8 torpedoes
4-in. ammunition	A-10-M	.....
4-in. ammunition	A-10-M	.....
4-in. ammunition	In Ward Room	.....
4-in. ammunition	Dining Room	.....
4-in. ammunition	In Ordnance	.....
4-in. ammunition	Store Room	.....
4-in. ammunition	In W. T. Box on	.....
4-in. ammunition	After Side of	.....
4-in. ammunition	After Deck-	.....
4-in. ammunition	house	.....

BAT

Caliber

4-inch gun
4-inch gun
4-inch gun
4-inch gun

D
For
Ma
Ma
Ma

Caliber

5.2 M x 45 CM Twin
5.2 M x 45 CM Twin
5.2 M x 45 CM Twin
5.2 M x 45 CM Twin

Name

45 cal. Colt's automatic revolver
30 cal. Rifle Model, 1903
30 cal. Rifle Model, 1898

Con

LIST OF AMMUNITION STOWAGE.

Type	Compartment	Total Capacity	Allowance	No. in Box or Tank	Stowage Size
4-inch ammunition	A-11-M	264 tanks	320 tanks	1 cartridge	6.32" dia. x 51.92"
4-inch ammunition	D-5-M	150 tanks		1 cartridge	6.32" dia. x 51.92"
4-inch drill	A-10-M	5 tanks	10 tanks	1 cartridge	6.32" dia. x 51.92"
4-inch drill	D-5-M	5 tanks		1 cartridge	6.32" dia. x 51.92"
30-cal. rifle	A-10-M	8 boxes	5 boxes		
		9,600 cartridges	6,000 cartridges	1,200 cartridges	34.5" x 9.5" x 8.25"
30-cal. rifle	A-10-M	7 boxes	4 boxes		
		8,400 cartridges	4,800 cartridges	1,200 cartridges	34.5" x 9.0" x 7.5"
30-cal. (Dummy)	A-10-M	1 box	1 box		
		1,000 cartridges	1,000 cartridges	1,000 cartridges	21.75" x 12.5" x 7.0"
45-cal. Pistol (automatic)	A-10-M	8 boxes	5 boxes		
		16,000 cartridges	10,000 cartridges	2,000 cartridges	16.25" x 12.75" x 7.625"
Warheads	A-12-M	6 warheads	8 warheads	1 warhead	24.5" x 22.5" x 34.5"
Warheads	D-5-M	2 warheads			
Impulse powder	A-10-M	1 tank	1 tank		10.25" x 10.25" x 16.75"
Torpedoes 45 CM	Stowed in tubes	8 torpedoes	8 torpedoes		
Superheater fuses	A-10-M		1 box		
Impulse primers	A-10-M		1 box		
Dry gun cotton primers	In Ward Room Dining Room		8 primers		
Wet gun cotton primers	In Ordnance Store Room		8 primers		
Detonators	In W. T. Box on After Side of After Deck- house		8 detonators	8 detonators	

BATTERY—GUNS

Caliber	LOCATION		Number
	Deck	Frame	
4-inch gun	Forecastle	25 C. L.	1
4-inch gun	Main	54 Port	1
4-inch gun	Main	54 Stb'd	1
4-inch gun	Main	146 C. L.	1
		Total	4

TORPEDO TUBES

Caliber	LOCATION		Number
	Deck	Frame	
5.2 M x 45 CM Twin	Main	75 Port	2
5.2 M x 45 CM Twin	Main	75 Starboard	2
5.2 M x 45 CM Twin	Main	119-120 Port	2
5.2 M x 45 CM Twin	Main	119-120 Starboard	2
		Total	8

SMALL ARMS

Name	Compartment	Frame	No. Allowed	Remarks
.45 cal. Colt's automatic revolver	A-10-M	41-42 Starboard	72	Stowed in rack
.30 cal. Rifle Model, 1903	A-10-M	Bulkhead No. 44	10	Stowed in rack
.30 cal. Rifle Model, 1898	.....	.....	5	.....

The fore and aft position of the gauges from the perpendiculars, also the position of the draft figures are given on the draft diagrams appended hereto. See plates No. 1 and No. 4.

The reading at internal gauges gives draft at location of gauges. To use the gauges in connection with determining the displacement, or to find draft above bottom of keel, spot readings obtained at internal gauges on the draft diagram at their respective scales marked "Forward Draft Gauge," "Midship Draft Gauge" and "Aft Draft Gauge." A straight line drawn through the points on the scales of the forward and aft draft gauges and extended through the scales of the forward and aft draft figures should pass through the point spotted on the scale of midship draft gauge providing the ship is neither hogged nor sagged. The drafts read on the diagram at the scales of the forward and after draft figures are the drafts of the ship above bottom of keel.

The displacement in tons of salt water, tons per inch immersion, and tons additional displacement for one foot change of trim by the stern are shown on the diagram. As an example, assume the forward internal draft gauge to read 8-feet 3-inches, the aft internal draft gauge 9-feet 3-inches. The figures on outside of ship, as taken from draft diagram, will read as follows: forward 8-feet $1-19/64$ inches, aft 9-feet $4-11/64$ inches, which gives a mean draft amidship of 8-feet $8-47/64$ inches above bottom of keel.

Displacement taken from draft diagram for above mean draft of 8-feet $8-47/64$ inches, shows 932.43 tons of salt water.

The difference between reading at forward and aft external draft figures above bottom of keel, viz., 9-feet $4-11/64$ inches and 8-feet $1-19/64$ inches, gives a trim by stern of 1-foot $27/8$ inches, which at the above referred to displacement is equal to 2.85 tons additional or displacement of 932.43 tons plus 2.85 tons, equals 935.28 tons, which is the actual displacement in salt water.

If ship is floating in other than salt water, a correction for density should be made.

If the line drawn on the draft diagram through the points spotted on the scales of the forward and aft draft gauges, described above, does not pass through the point spotted on the scale of midship draft gauge, the ship is either hogged or sagged. The ship is hogged when the draft as indicated by the above mentioned line is greater than that obtained from actual reading of midship internal draft gauge. The ship is sagged when the opposite condition prevails.

In the above example the draft at the midship draft gauge as shown by the line on the diagram is 8-feet $8-47/64$ inches; assuming the draft read on the ship at the internal midship draft gauge to be 8-feet $7-47/64$ inches, this shows a hog of 1-inch and a correction to the above displacement is necessary as follows: Hog in inches, multiplied by 0.636 multiplied by the tons per inch immersion at the mean draft of ship. Under the conditions named this results in a correction of 8.95 tons. The actual displacement of the ship corrected for hog is 935.28 tons minus 8.95 tons, equals 926.33 tons.

PROPELLING MACHINERY

Turbine Data.

Turbine	Mean Diameter of Blades	Stages
Ahead	$5'-2-15/16''$ $5'-2-15/16''$ $5'-2-11/16''$ $5'-4-19/64''$ $5'-4-29/32''$ $5'-6-23/32''$	1 to 11 wheel 12 drum 13 drum 14 drum 15 drum 16, 17, 18 drum
Astern	$4'-7-1/8''$	1 to 4 wheel 5 to 8 drum

Compound, 2 cylinder, vertical inverted type, high pressure cylinder 13" diameter, low pressure cylinder 25" diameter 12" stroke.

ARRANGEMENT OF TURBINES AND ENGINES.

Starboard shaft.....Main ahead and astern turbine and reciprocating engine in tandem
 Port shaft.....Main ahead and astern turbine and reciprocating engine in tandem

Boiler Data.

Kind of boiler (oil burning).....	White Forster
Built by.....	Babcock and Wilcox
Number (two in each boiler compartment).....	No. 4
Designed working pressure, pounds.....	260
Heating surface (each boiler) area in square feet.....	5,400
Diameter of main steampipe, inches (two in number) (each).....	9½
Diameter of steampipe from each boiler, inches.....	7
Cubical contents of combustion chamber, cubic feet (each boiler).....	452.5
Number of oil burners (each boiler).....	11
Number of furnaces (each boiler).....	1
Smoke pipes, height above bottom of keel.....	{ 38'-2½" aft 38'-4¼" mid aft 38'-5-11/16" mid forward 38'-7-3/16" forward
Number of smokestacks (all boilers).....	4
Oil firing arrangements are Schutte & Koerting patent.	

SHAFTING.

Diameter of shafting, inches.....	8½
Diameter of axial hole, inches.....	4½

PROPELLERS.

Number of propellers.....	2
Number of blades (each propeller).....	3
Diameter, feet and inches.....	7'-81/2"
Pitch fixed, feet and inches.....	6'-8"
Ratio of diameter to pitch.....	1 to 0.8648
Area, projected, square feet.....	28.208
Area, helicoidal, square feet.....	31.50
Area, disc, square feet.....	46.666
Lower tip of blade below bottom of keel, inches.....	1/4"
Material of propellers.....	Manganese bronze (cast)

ELECTRIC PLANT

There are two turbo-generators of 25 k.w. capacity, at 125 volts direct connected to Terry turbines at designed speed of 3,000 R.P.M.; located in the machinery space, Compartment C-1, between frame Nos. 98-103, starboard side. The turbines were built by the Terry Steam Turbine Company and the generators by the Diehl Manufacturing Company.